

## C.11 SAVANNAH RIVER OPERATIONS OFFICE SUMMARY

**NOTE:** This site summary provides information and data for sites under the Department's Savannah River Operations Office. The data for this summary were collected in 1999 and do not necessarily reflect funding or completion profiles for the site. The data do not include changes that resulted from actual FY 2000 appropriations or anticipated changes as a result of both FY 2000 supplemental and FY 2001 budget requests. The Department is in the process of updating its life-cycle information for the EM program.

The 1999 data were the basis for DOE's *Status Report on Paths to Closure* (March 2000). The costs in the "Cost and Completion Date" section of this summary are the sum of the project planning baselines prepared by the field office and generally do not include estimates of project uncertainty. On the other hand, the cost range in the national status report includes an estimate of the cost resulting from project uncertainties, and EM's overall estimate of life-cycle costs of \$151-195 billion from FY 2000 to FY 2070 (or \$168-\$215 billion if the costs incurred between FY 1997 and FY 2000 are included in the cost range estimate).

The Savannah River Site (SRS) was established in 1950 to produce special radioactive isotopes for national security purposes (e.g., plutonium-239 and tritium). In addition to this primary mission, SRS has produced other special isotopes (for example, californium-252, plutonium-238, americium-241, etc.) to support research in nuclear medicine, space exploration, and commercial applications.

Since the end of the Cold War, the mission of SRS has shifted from nuclear material production to environmental management. The Environmental Management (EM) program was initiated in 1989 to address the closure of old burial grounds and seepage basins. In FY 1992, the last of the production reactors was briefly operated. The production mission of the reactor program and supporting facilities was formally ended the following year.

Current activities managed by EM at SRS cover four major programs: nuclear material stabilization, facility stabilization and deactivation, environmental restoration, and waste management. The primary drivers for these programs are the Federal Facility Agreement, the Federal Facility Compliance Act Consent Order, and the Defense Nuclear Facilities Safety Board Recommendation 94-1. These agreements define commitments and milestones for SRS. Although this document addresses environmental cleanup, it is important to recognize that SRS retains an active role in stockpile stewardship that supports national security needs.

### C.11.1 End State

The status of SRS is such that no significant land-use changes are projected through 2006. While progress will be made to reduce legacy risks and eliminate mortgage requirements, the land-use designations will remain basically unchanged for any particular project area and the site as a whole. The completion of key EM activities are:

- ❑ Material stabilization activities and the initiation of canyon deactivation activities by FY 2006;
- ❑ High-level waste (HLW) vitrification and disposal activities by the end of FY 2026 and the operational closing of all waste tanks by the end of FY 2028;
- ❑ Transuranic (TRU) waste processing and disposal by the end of FY 2070 and other wastes by end FY 2035;
- ❑ Spent Nuclear Fuel (SNF) stabilization/disposal by the end of FY 2037;
- ❑ Environmental Restoration remediation of soils and groundwater by the end of FY 2025; and
- ❑ Initiation of long-term environmental stewardship activities in FY 2038 when the site cleanup is estimated to be completed.

Significant changes in land-use designations may occur during the activities identified above. These will be addressed in the SRS Comprehensive Plan. Stakeholder involvement in future land use decisions has already begun with the SRS Citizens Advisory Board, area planners, chambers of commerce, municipalities, and others providing suggestions for future land-use. As the Comprehensive Plan is developed, internal and external site stakeholders will be continually involved in the process. After the SRS EM mission is complete, site boundaries should remain unchanged, and the land should remain under the ownership of the federal government for either new site missions or for continued ecological research as a National Environmental Research Park. Regional environmental groups and national researchers have stressed that the site boundaries should remain unchanged to preserve its unique habitats. The flora and fauna at the site are such that the site could be used as a sanctuary for environmental study and observation.

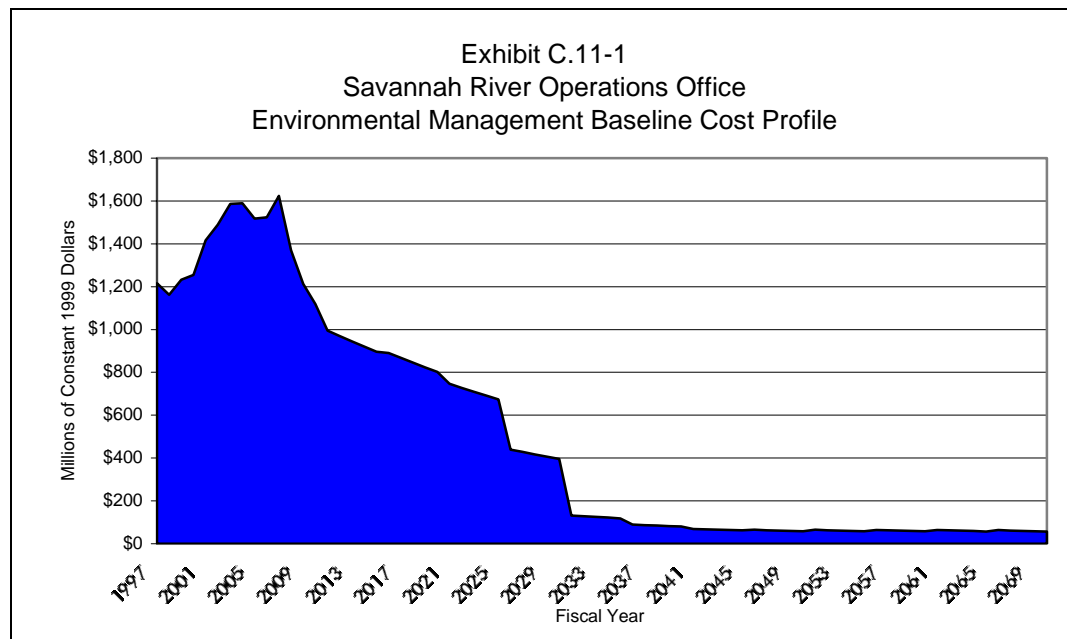
### C.11.2 Cost and Completion Dates

The Savannah River Operations Office has divided its EM work into 92 discrete projects. A Project Baseline Summary (PBS) exists for each project and contains detailed programmatic information, including cost, schedule, scope, end state, and

interim milestones. For more information on each project, see each individual PBS.

The sum of the costs of the planning baselines for individual projects managed by the Savannah River Operations Office is \$36.8 billion (constant 1999 dollars). The life-cycle cost is a planning estimate that includes costs for material stabilization, facility deactivation and long-term monitoring, waste management, and environmental restoration. Decisions on the ultimate end state of some of the facilities have not been made yet; however, the planning estimate is not intended to preclude any ultimate end state options. Based on these planning assumptions, the estimate could be applied to a range of decontamination and decommissioning (D&D) options, including entombment of facilities. The overall completion date for EM work scope at the SRS is 2038, with long-term surveillance and maintenance activities continuing beyond 2070.

The Savannah River Operations Office cost profile for EM activities was developed by combining the cost estimates presented in each of the PBSs. Exhibit C.11-1 displays the resultant baseline cost profile.



### C.11.3 Accomplishments Since the 1998 *Paths to Closure* Report

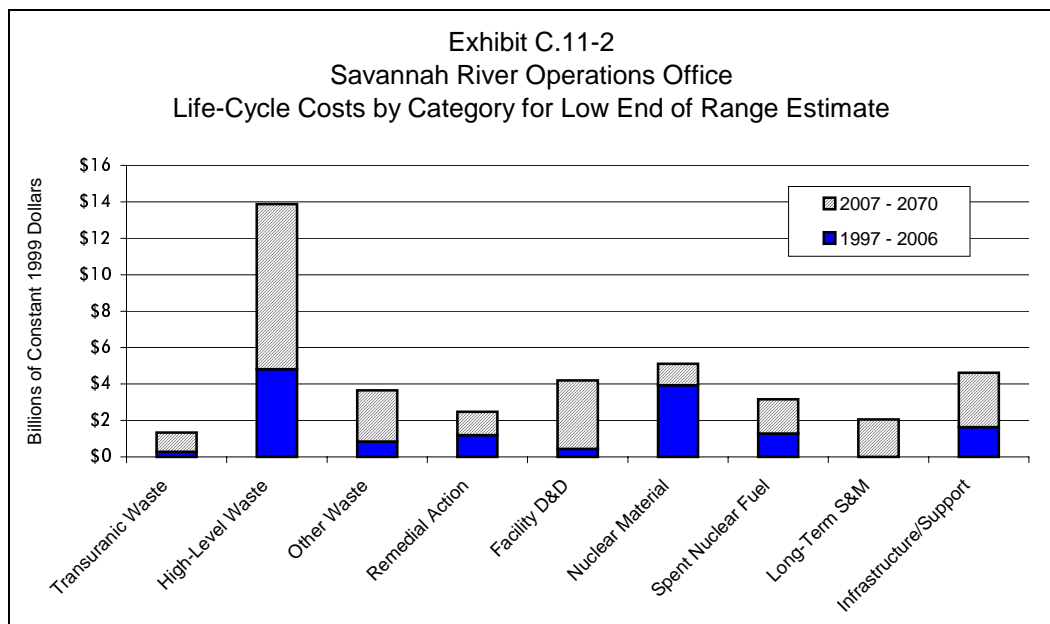
Since the 1998 *Paths to Closure* report, the Savannah River Operations Office accomplished several key programmatic goals including the following:

- ❑ Produced 236 canisters of vitrified HLW in 1999, exceeding the goal of 200 canisters and bringing the total produced to date to 719 canisters (13 percent of program total);
- ❑ Completed stabilization of plutonium-238 residues and plutonium-239 and plutonium-238 solutions;
- ❑ Reached completion of 33 percent of groundwater treatment, 68 percent of contaminated acres, and 44 percent of waste units with another eight percent in the remediation phase;
- ❑ Completed the TRU waste drum retrieval program two years ahead of schedule;
- ❑ Completed the demobilization and shutdown of heavy water production facilities; and
- ❑ Deployed 19 new technologies during 1999, bringing the total to 49 for Environmental Restoration.

### C.11.4 Work Scope Summary

The scope of work at the Savannah River Operations Office includes the management of HLW sludges and salts; spent nuclear fuel from SRS and other DOE facilities, universities, and foreign research reactors; soil, sludges, debris, and groundwater contaminated with radionuclides and hazardous substances; and numerous excess facilities and nuclear materials. More information about work scope can be found at the following websites. These websites contain links to the conceptual summary disposition maps (<http://emi-web.inel.gov/summary.html>) and the detailed disposition maps (<http://emi-web.inel.gov/dmaps.html>) in PDF format.

Exhibit C.11-2 illustrates the life-cycle costs by major work scope categories. HLW accounts for the largest portion of the total life-cycle cost at the Savannah River Operations Office.

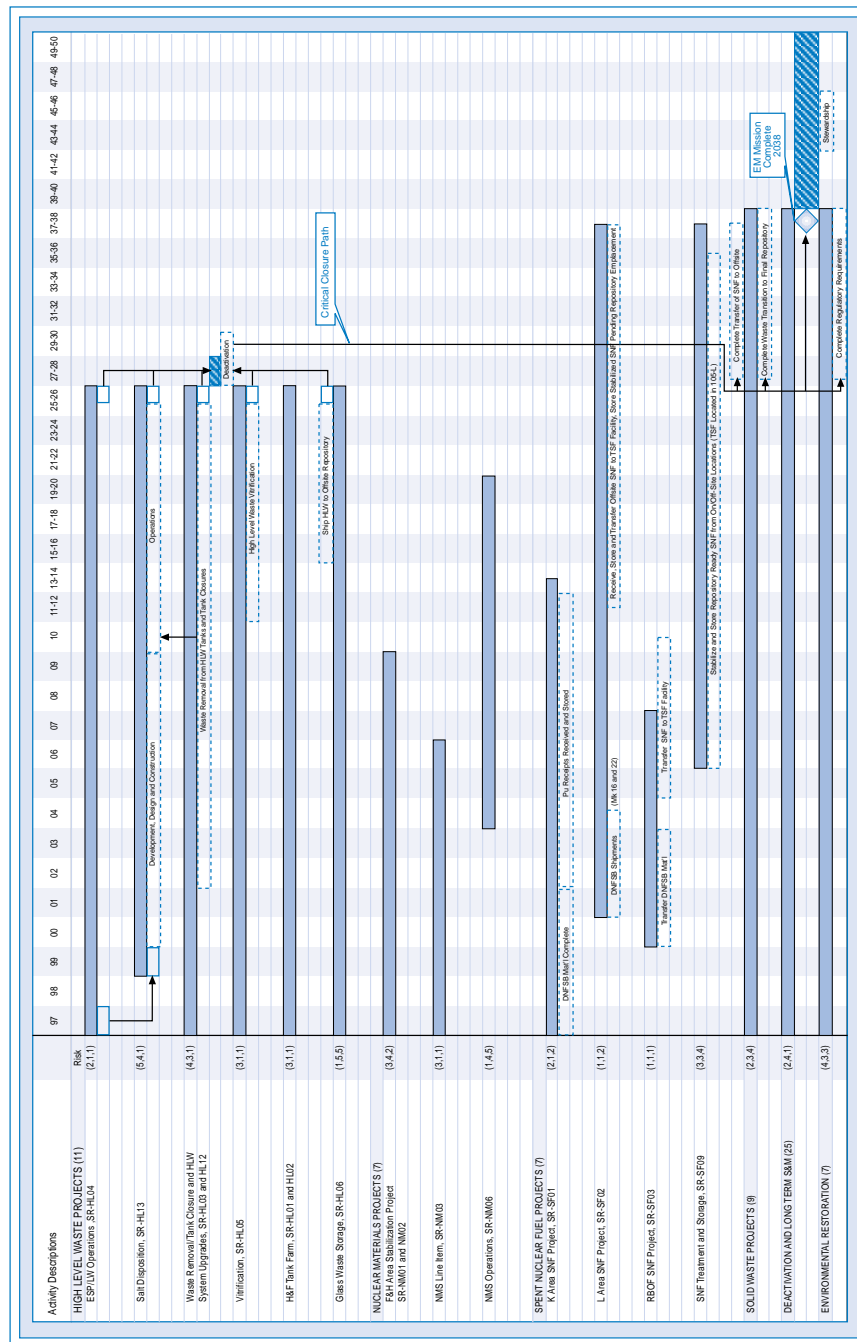


### C.11.5 Critical Closure Path and Programmatic Risk

The critical closure path schedule presented in Exhibit C.11-3 sets forth the estimate for completing closure activities at the Savannah River Operations Office. The critical closure path identifies the sequence of major cleanup activities that have little scheduling flexibility and must occur without delay if the SRS EM cleanup mission is to be completed on time. Sites have assigned programmatic risk scores to each of these activities and events. Exhibit C.11-4 presents a summary of activities and milestones on the critical closure path that have high programmatic risk (programmatic risk scores of 4 or 5 in any category).

Exhibit C.11-5 displays a summary of waste disposition data that have high programmatic risk (programmatic risk scores of 4 or 5 in any category).

Savannah River Operations Office  
Critical Closure Path



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Exhibit C.11-4  
Savannah River Operations Office  
Summary of High Programmatic Risk Milestones

Project, Action, Event	Dates	Programmatic Risk Categories*		
		Technological	Work Scope Definition	Intersite Dependency
Transfer Storage Facility Operational	April 2005	3	3	4
Complete Neptunium Solution Conversion to Oxide	December 2005	4	5	5
Initiate Salt Removal Demonstrations	October 2009	4	1	1
Receiving Basin for Offsite Fuel Deactivated	September 2010	1	4	1
Complete Salt Alternative Line Item and Initiate Radioactive Operations	September 2010	5	5	1
F Canyon Deactivated	September 2011	1	4	1
R Reactor Deactivated	December 2011	1	4	1
C Reactor Deactivated	December 2011	1	4	1
Complete Waste Removal Demonstrations	October 2012	4	1	1
K Reactor Deactivated	December 2020	1	4	1
L Reactor Deactivated	December 2045	1	4	1

\*For a discussion of programmatic risk categories, see Appendix D on the Internet site <http://www.em.doe/closure/>.



Exhibit C.11-5  
Savannah River Operations Office  
Summary of High Programmatic Risk Waste Disposition Data

Stream Name	Waste Stream Activity Name	Programmatic Risk Categories*		
		Technological	Work Scope Definition	Intersite Dependency
Bulk Metal for Survey/ Decontamination	Treatment	4	3	1
Contaminated Large Equipment for Survey/ Decontamination	Treatment	4	3	1
Survey/ Decontamination to Free Release	Disposal	4	3	1
Contaminated Large Equipment (CLE) to Size Reduction	Treatment	4	1	1
Size Reduction CLE to E Area Trench	Disposal	4	3	1
Size Reduction CLE to Offsite Disposal	Disposal	4	3	1
Special Case Waste	Generation	3	5	1
Special Case Waste	Treatment	4	1	3
High Activity TRU Drums Requiring Processing	Other Processing	3	4	1
High Activity Drums Requiring Treatment	Treatment	4	4	1
High Activity TRU High Efficiency Particulate Air (HEPA) Filters Requiring Treatment	Treatment	3	4	1
Carbon Steel Containers and Casks Requiring Processing	Other Processing	4	3	1
Carbon Steel Containers and Casks Requiring Treatment	Treatment	4	3	1
Listed/characterized soils/sludges	Treatment	5	5	5
Tritiated oil with mercury	Generation	1	5	1
Tritiated oil with mercury	Treatment	1	5	5
LLW Soil, Rubble, Debris	Collect & Dispose	1	5	1
LLW Soil, Rubble, Debris	Incorporated by Parent Stream	2	5	1

Exhibit C.11-5  
Savannah River Operations Office  
Summary of High Programmatic Risk Waste Disposition Data

Stream Name	Waste Stream Activity Name	Programmatic Risk Categories*		
		Technological	Work Scope Definition	Intersite Dependency
Hazardous Waste (HW) Soil/Rubble/Debris	Treatment/ Disposal	1	4	3
HW Soil/Rubble/Debris	Generation	1	4	1
Radioactive (Rad) Polychlorinated Biphenyl (PCB) Debris	Collect & Treat	1	5	1
Rad PCB Debris	Incorporated by Parent Stream	1	1	5
Mixed Low-Level Waste (MLLW) Soil/Rubble/Debris	Generation	1	4	1
MLLW Soil/Rubble/Debris	Incorporated by Parent Stream	1	4	1
MLLW Solvents	Incorporated by Parent Stream	4	3	1
Low-Level Waste (LLW) Soils (Soil Mix)	In-Situ Treatment	1	5	1
Hazardous Soils (Bio-Remediation)	In-Situ Treatment	1	5	1
Hazardous waste from AM (secondary stream)	Treatment/Disposal	1	5	1
Hazardous Liquid from AR (secondary stream)	Treatment	1	4	1
LLW Soil/Rubble/Debris (Cap)	In-Situ Containment	1	4	5
Hazardous Groundwater	Collect & Treat	3	4	1
Hazardous Groundwater	Treatment	5	5	3
LLW Soils/Coal	Collect & Recycle	3	4	1
LLW Soils/Coal	Recycle	3	4	3
Incinerable waste from other DOE Sites	Treatment	3	5	3
TRU Waste Ready for Ship to the Waste Isolation Pilot Plant	Disposal	4	4	3

Exhibit C.11-5  
Savannah River Operations Office  
Summary of High Programmatic Risk Waste Disposition Data

Stream Name	Waste Stream Activity Name	Programmatic Risk Categories*		
		Technological	Work Scope Definition	Intersite Dependency
Washed Tanks	Other Processing	4	1	1
Incinerable radioactive PCBs	Treatment/ Disposal	1	5	5

\*For a discussion of programmatic risk categories, see Appendix D on the Internet site  
<http://www.em.doe/closure/>.